

**SOME OBSERVATIONS ON *EMPIS LIVIDA*, LIN. (DIP.,
EMPIDIDAE), WITH NOTES ON PREY.**

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The male of *Empis livida*, Lin., takes prey which is presented to the female and while she feeds upon it copulation takes place, the duration of which probably depends upon the size of the prey (see Hamm, 1908, 9). I was able to study this species while on a week's holiday at Bodenham, near Hereford, during 1948. Although I was not fortunate in having fine weather for my activities, I did make some interesting observations as well as securing some specimens with prey.

The best spot for observation was along the River Lugg, where *livida* was in fair numbers among the rushes which grew along the water's edge. Heavy rainfall had churned the banks into mud and this hampered my activities considerably. Observations were commenced on 31st July between 3.30 p.m. and 6 p.m. (B.S.T.), the weather being very dull indeed. Both sexes were at rest on the rushes and forget-me-nots. Several females were sitting close together and periodically one or the other would take to flight. This prompted the others to follow suit, and all would circle round several times before coming to rest again, most often in a different place to that previously occupied. I saw no pairs *in cop.* but I captured a few males with dipterous and trichopterous prey.

On the evening of 1st August, at about 7 p.m., I saw a few pairs *in cop.* along a hedgerow. Unfortunately, I was without a net but I managed to box a pair; the female was in possession of dipterous prey. Previous to capture I had watched this pair making short flights from one twig to another, hardly resting before they were off again. The landing seemed clumsy and made considerable noise, and judging by the short distances covered by each flight quite an effort seemed necessary to keep in the air. I did not observe if both insects made use of their wings, but it would be interesting to note this on some future occasion. The wariness of these insects in my experience makes close observation difficult.

2nd August was another dull day with frequent rainy periods and *livida* was not very active. I only saw one pair *in cop.*, which I secured. The female dropped the prey and the pair separated. On taking this from the net I found it to be the mutilated remains of a *Chironomid* fly. One single male was taken with trichopterous prey.

The poor weather persisted throughout Tuesday, 3rd August, and the vegetation was wet, due to a heavy rainfall during the night. I only saw two single males with prey, one of which I secured; this had dipterous prey. The other I followed for some time, hoping to observe courtship and copulation. It made frequent circling flights, apparently in search of females, but eventually I lost it among the rushes. The prey appeared to be dipterous, but I was not close enough to be certain. Several individuals were at rest on flowers of forget-me-not, each actively moving its proboscis over the surface of the petals. On closer examination it could be seen that they were drinking from the globules of rain scattered over the surface of the flowers.

4th August was a much brighter and warmer day, but the sun did not break through the clouds until the afternoon. There was considerable activity among *livida* and I was soon busy collecting material. The prey taken was quite varied among various families of Diptera and I was quite satisfied with the morning's work.

Rain came again during the night, and it continued throughout most of the morning of 5th August. The sun broke through once, and what activity this promoted I took advantage of. I took two males with ephemeropterous prey. I had wondered why I had not encountered this before, as there were a number of mayflies about. I saw three pairs *in cop.*, two out of reach and one which I followed for some time but eventually lost. Further upstream along a sheltered backwater, which was drier and more pleasant to work, I found *livida* in some numbers, at rest on thistles and nettles. Both sexes were engaged in imbibing nectar from the thistle flowers.

6th August commenced warm and bright and I was filled with the hope of a good day's work, but by 10.30 a.m. the skies had clouded and rain commenced. Although I spent the rest of the morning observing from beneath a nearby tree I saw little of interest and collected very little material.

METHODS OF HOLDING PREY.

The majority of the single males employed the median pair of legs only in holding the prey, the anterior and posterior pairs being used to hold on to their place of rest. A few of them were holding their prey with the posterior and median pairs of legs and one of the anterior pair, the remaining anterior leg bearing the whole weight of the insect as it hung suspended from the twig or leaf on which it had settled. The prey taken from the single males was apparently uninjured, though motionless with the exception of a badly mutilated ephemeropteran (*Ephemerella ignita*, Pod.) devoid of its abdomen, and the *Chironomus* and *Culex* marked with a ? in the table. Possibly the male had already contacted a female which had fed on the prey, but it seems hardly likely that he would take back the prey after an attempt at copulation. The specimen of *Mystacides nigra*, L., was still feebly kicking when I took it from the net, but this must have taken a little more to kill as it was quite large compared with the other types of prey met with.

Of the pairs observed *in cop.* the male was hanging by either of the two anterior tarsi, or by both of them. All the remaining legs were used to clasp the female. The female employed all her legs in holding the prey and thrusting it up and down on her proboscis.

SUMMARY AND ANALYSIS OF PREY.

I saw no single females in possession of prey, only those *in cop.* Of all the males with prey not one appeared to be feeding on it. Mr A. H. Hamm gives an interesting account of the method of disabling the prey adopted by *Empis tessellata*, Fab. (*Ent. Mon. Mag.*, 1909, Vol. XX, p. 159), i.e., by piercing the junction between the thorax and the head, apparently affecting the central nervous system and producing a paralyzing effect. It may be that *livida* adopts this method also.

Copulation apparently takes place at all hours of the day and in fine or wet weather.

The following table illustrates the nature of the prey taken from 35 sets of material collected. From these results it can be seen that most of the prey taken belong to the Diptera. I can find no previous record of Hemiptera being taken as prey by *livida*. The author would welcome any notes or records of the predaceous habits of the Empididae.

Order.	Family.	Species.	No. taken		
			From single ♂♂	From ♂♂ and ♀♀ in cop.	Total.
Ephemeroptera	Leptophlebiidae	<i>Paraleptophlebia cincta</i> , Retz.	3	—	3
		<i>Habrophlebia fusca</i> , Curt.	1	—	1
Trichoptera	Ephemerellidae	<i>Ephemerella ignita</i> , Poda	1	—	1
	Leptoceridae	<i>Mystacides nigra</i> , Lin.	1	—	1
	Polycentropidae	<i>Cyrnus trimaculatus</i> , Curt.	1	—	1
Hemiptera	Psychomyiidae	<i>Psychomyia pusilla</i> , Fab.	8	—	8
	Miridae	<i>Orthotylus flavinervis</i> , Kbm.	1	—	1
Diptera	Culicidae	? <i>Culex pipiens</i> , Lin.	1	—	1
	Chironomidae	<i>Pentaneura monilis</i> , Lin.	1	—	1
		? <i>Chironomus</i> spp.	1	—	1
		?Mutilated	—	1	1
	Mycetophilidae	<i>Mycetophila fungorum</i> , Deg.	1	—	1
	Empididae	<i>Rhamphomyia flava</i> , Fall.	—	1	1
	Dolichopodidae	<i>Campsicnemus scambus</i> , Fall.	1	—	1
	Sepsidae	<i>Sepsis cynipsea</i> , Lin.	—	1	1
	Sphaeroceridae	<i>Trichiaspis stercoraria</i> , Mg.	1	—	1
		<i>Scopeuma stercoraria</i> , Lin.	—	1	1
	Calliphoridae	<i>Morinia nana</i> , Mg.	1	—	1
	Muscidae	<i>Pollenia varia</i> , Mg.	1	—	1
		<i>Limnophora triangula</i> , Fall.	—	1	1
		<i>Limnophora scrupulosa</i> , Zett.	1	—	1
		<i>Hebecnema umbratica</i> , Mg.	1	—	1
<i>Helina duplicata</i> , Mg.		1	—	1	
<i>Myopina reflexa</i> , R.-D.		1	—	1	
<i>Pogohylemyia gnava</i> , Mg.		1	—	1	
<i>Erioischia brassicae</i> , Bouché		—	1	1	
		29	6	35	

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CURRENT NOTES.

WINTER FLIES.—Few fly fishers give much thought to their streams during the winter months; yet the winter fly hatches are worth more thought than is usually given to them. It has been a queer winter on the quieter streams; perhaps a still queerer autumn. October and November last year produced hatches which were almost as good as those during the fishing season. One Wiltshire stream even had a distinctly good hatch of mayfly, of all odd happenings, in November, and from the number of mayfly nymphs killed in a Berkshire pollution near the end of October it is probable that this phenomenon took place on many streams where lack of grayling fishers prevented it being reported.

Were these autumn hatches from a spring egg laying, a good part of which had matured before the winter instead of the more usual course of growing very slowly in the cold months and hatching in the spring? And will this mean a poorer hatch of what is left for the spring months?—M. B.

THE Zoological Section of the S.E. Union of Scientific Societies, held at Canterbury, April 19th-22nd. Programme from Winifred Boyd Watt, Hon. Secretary.

THE magazine is suffering from the lack of the smaller "Collecting Notes." The abnormal weather must have affected many early stages of our Spring Lepidoptera. In such circumstances immigrant species will not survive unless they have already become firmly established.